

**What Is Claimed Is:**

1        1. A layer jump control apparatus for controlling a layer  
2        jump process of an optical drive, wherein the layer jump process  
3        comprises a kicking process, a holding process, a braking  
4        process and a waiting process, the layer jump control apparatus  
5        comprising:

6        a pick up head having a lens and a voice coil motor, wherein  
7        the pick up head drives the voice coil motor in accordance with  
8        a driving force to vertically move the lens;

9        a preamplifier for producing a focusing error signal;

10       a controller for receiving the focusing error signal and  
11       producing a focusing control signal;

12       a low pass filter for receiving the focusing control signal  
13       and producing a layer distance balancing signal; and

14       a driving device for outputting the driving force;

15       wherein:

16       the driving device receives the focusing control signal to  
17       determine the driving force when the optical drive does not  
18       perform the layer jump process;

19       the driving device receives a kicking signal and the layer  
20       distance balancing signal to determine the driving force when  
21       the optical drive performs the kicking process;

22       the driving device receives a braking signal and the layer  
23       distance balancing signal to determine the driving force when  
24       the optical drive performs the braking process; and

25       the driving device receives the layer distance balancing  
26       signal to determine the driving force when the optical drive  
27       performs the holding process and the waiting process.

1        2. The layer jump control apparatus according to claim 1,  
2 wherein the optical drive is a DVD drive.

1        3. The layer jump control apparatus according to claim 1,  
2 wherein the controller is an equalizer.

1        4. The layer jump control apparatus according to claim 1,  
2 wherein the layer distance balancing signal is a direct current  
3 voltage level of the focusing control signal.

1        5. An optical drive for performing a layer jump process,  
2 wherein the layer jump process comprises a kicking process, a  
3 holding process, a braking process and a waiting process, the  
4 optical drive comprising:

5        a pick up head having a lens and a voice coil motor, wherein  
6 the pick up head drives the voice coil motor in accordance with  
7 a driving force to vertically move the lens;

8        a preamplifier for producing a focusing error signal;

9        a controller for receiving the focusing error signal and  
10 producing a focusing control signal;

11       a low pass filter for receiving the focusing control signal  
12 and producing a layer distance balancing signal; and

13       a driving device for outputting the driving force;

14       wherein:

15       the driving device receives the focusing control signal to  
16 determine the driving force when the optical drive does not  
17 perform the layer jump process;

18       the driving device receives a kicking signal and the layer  
19 distance balancing signal to determine the driving force when  
20 the optical drive performs the kicking process;

21 the driving device receives a braking signal and the layer  
22 distance balancing signal to determine the driving force when  
23 the optical drive performs the braking process; and  
24 the driving device receives the layer distance balancing  
25 signal to determine the driving force when the optical drive  
26 performs the holding process and the waiting process.

1 6. The optical drive according to claim 5, wherein the  
2 optical drive is a DVD drive.

1 7. The optical drive according to claim 5, wherein the  
2 controller is an equalizer.

1 8. The optical drive according to claim 5, wherein the layer  
2 distance balancing signal is a direct current voltage level of  
3 the focusing control signal.

1 9. A method of controlling an optical drive to perform a layer  
2 jump process, wherein the optical drive comprises a vertically  
3 movable pick up head, a preamplifier, a controller, and a low  
4 pass filter, the method comprising the steps of:

5 receiving a focusing error signal produced by the  
6 preamplifier in the controller to produce a focusing control  
7 signal;

8 sending the focusing control signal to the low pass filter  
9 to produce a layer distance balancing signal;

10 performing a kicking process in accordance with a kicking  
11 signal and the layer distance balancing signal;

12 performing a holding process in accordance with the layer  
13 distance balancing signal;

14 performing a braking process in accordance with a braking  
15 signal and the layer distance balancing signal; and  
16 performing a waiting process in accordance with the layer  
17 distance balancing signal.

1 10. The method according to claim 9, wherein the optical  
2 drive is a DVD drive.

09974304  
1 11. The method according to claim 9, wherein the controller  
2 is an equalizer.

1 12. The method according to claim 9, wherein the layer  
2 distance balancing signal is a direct current voltage level of  
3 the focusing control signal.